UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,305	03/23/2001	Toshiaki Hongo	P 0279274 EL01001CDC	4649

909 7590 01/09/2003

PILLSBURY WINTHROP, LLP
P.O. BOX 10500
MCLEAN, VA 22102

EXAMINER
ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
1763	10

DATE MAILED: 01/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/815,305	HONGO ET AL.	
	Examiner	Art Unit	
	Luz L. Alejandro	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 4-20* is/are pending in the application.

4a) Of the above claim(s) *10-13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-9 and 14-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 6-7, 14, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomoyasu et al., U.S. Patent 5,900,103.

Tomoyasu et al. shows the invention as claimed including a plasma processing apparatus 700 for applying a plasma process to an object to be processed, the plasma process apparatus comprising: a process chamber 710 in which the object to be processed is subjected to the plasma process; a gas introducing part (see fig. 37) connected to said process chamber so as to introduce a reactant gas into said process

chamber and including an inlet port 738A and a an outlet port 750A; a first vacuum pump connected to said process chamber through an exhaust line 760 so as to evacuate gas from said process chamber so that said process chamber is maintained at negative pressure; and a gas-evacuating arrangement 750A connected to said gas-introducing part so as to evacuate the reactant gas from said gas-introducing part (see figs. 35 and 37 and col. 16-line 42 to col. 18-line 25).

With respect to claim 6, Tomoyasu et al. discloses a gas introducing part comprising a dielectric plate 774 and a shower plate 780a provided on a top of said process chamber so as to introduce the reactant gas from the top of said process chamber, a gas passage 770 being formed between said dielectric plate and said shower plate so that the reactant gas flows through the gas passage and is introduced into said process chamber through said shower plate. Additionally, Tomoyasu et al. also shows wherein the dielectric plate has an inlet port connected to said gas passage so as to supply the reactant gas to said gas passage, and said gas passage has an outlet port to which said gas-evacuating arrangement is connected (see fig. 37).

Tomoyasu et al. is applied as above but lacks anticipation of wherein said gas-evacuating arrangement comprises a second vacuum pump connected to said gas-introducing part, and wherein said gas-evacuating arrangement comprises a bypass passage which connects said gas-introducing part to said first vacuum pump by bypassing said process chamber. However, in view of the disclosure provided by Tomoyasu et al. it would have been obvious to one of ordinary skill in the art at the time the invention was made to either have a second vacuum pump to evacuate the gas-

introducing part in order to allow for separate controllability to evacuate either the process chamber or the gas introduction part at desired times, or to connect the gas-introducing part via a bypass to the first vacuum pump so as to reduce the overall size and complexity of the apparatus of Tomoyasu et al..

Claims 4-5 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomoyasu et al., U.S. Patent 5,900,103 in view of Li et al., U.S. Patent 5,772,771.

Tomoyasu et al. is applied as above but lacks anticipation of wherein said gas-introducing part has a plurality of circumferentially arranged nozzles through which the reactant gas is introduced and additionally comprises: at least one inlet port from which the reactant gas is supplied, an annular gas passage connected to said inlet port so that the reactant gas supplied from the inlet port is supplied to said plurality of nozzles by flowing through said annular gas passage, and an outlet port provided to said annular gas passage so that said gas-evacuating arrangement is connected thereto. Li et al. discloses a gas introducing part in a sidewall of the chamber having a plurality of circumferentially arranged nozzles 34, and at least one inlet port 80 from which the reactant gas is supplied, an annular gas passage 36 connected to said inlet port so that the reactant gas supplied from the inlet port is supplied to said plurality of nozzles 34 by flowing through said annular gas passage, and an outlet port 82 provided to said annular gas passage so that said gas-evacuating arrangement is connected thereto (see figs. 1, 4-5, and col. 3-line 20 to col. 5-line 37). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made

to modify the apparatus of Tomoyasu et al. so as to include the gas introducing part of Li et al. because this will allow for enhanced cleaning of the nozzles.

Claims 1, 6-9, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tei et al., 2002/0011215 A1 in view of Tomoyasu et al., U.S. Patent 5,900,103.

Tei et al. shows the invention substantially as claimed including a plasma processing apparatus for applying a plasma process to an object to be processed, the plasma processing apparatus comprising: a process chamber 101 in which the object to be processed is subjected to the plasma process; a gas introducing part connected to said process chamber so as to introduce a reactant gas into said process chamber and including a dielectric plate 113 and a shower plate 106 provided on a top portion of said process chamber so as to introduce the reactant gas from the top of the process chamber, a gas passage being formed between the shower and dielectric plates so that the reactant gas flows through the gas passage and is introduced into said process chamber through said shower plate; and a first vacuum pump connected to said process chamber through said exhaust 102 so as to evacuate gas from said process chamber so that said process chamber is maintained at a negative pressure (see fig. 1 and paragraphs 0061-0077). Additionally, Tei et al. discloses additional embodiments with a slot antenna having a plurality of slits so as to guide a microwave having a predetermined frequency and where the density of slits is substantially uniform in a radial direction of said slot antenna (see paragraphs 103-108).

Tei et al. fails to expressly disclose a gas-evacuating arrangement connected to said gas-introducing part so as to evacuate the reactant gas from said gas-introducing part or wherein said gas-evacuating arrangement comprises a second vacuum pump connected to said gas-introducing part, and wherein said gas-evacuating arrangement comprises a bypass passage which connects said gas-introducing part to said first vacuum pump by bypassing said process chamber. Tomoyasu et al., U.S. Patent 5,900,103 discloses a gas evacuating arrangement 750A (see Fig. 37) connected to a gas-introducing part so as to evacuate the gas from the gas-introducing part. In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Tei et al. so as to include a gas evacuating arrangement in the gas introducing part so as to eliminate unnecessary gas from the gas introducing part (see col. 18-lines 19-21 of Tomoyasu et al.). Furthermore, in view of the disclosure provided by Tomoyasu et al. it would have been obvious to one of ordinary skill in the art at the time the invention was made to either have a second vacuum pump to evacuate the gas-introducing part in order to allow for separate controllability to evacuate either the process chamber or the gas introduction part at desired times, or to connect the gas-introducing part via a bypass to the first vacuum pump so as to reduce the overall size and complexity of the apparatus of Tei et al. modified by Tomoyasu et al..

Claims 4-5 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tei et al., 2002/0011215 A1 in view of Tomoyasu et al., U.S. Patent 5,900,103 in view of Li et al., U.S. Patent 5,772,771.

Tei et al. and Tomoyasu et al. are applied as above but lacks anticipation of wherein said gas-introducing part has a plurality of circumferentially arranged nozzles through which the reactant gas is introduced and additionally comprises: at least one inlet port from which the reactant gas is supplied, an annular gas passage connected to said inlet port so that the reactant gas supplied from the inlet port is supplied to said plurality of nozzles by flowing through said annular gas passage, and an outlet port provided to said annular gas passage so that said gas-evacuating arrangement is connected thereto. Li et al. discloses a gas introducing part in a sidewall of the chamber having a plurality of circumferentially arranged nozzles 34, and at least one inlet port 80 from which the reactant gas is supplied, an annular gas passage 36 connected to said inlet port so that the reactant gas supplied from the inlet port is supplied to said plurality of nozzles 34 by flowing through said annular gas passage, and an outlet port 82 provided to said annular gas passage so that said gas-evacuating arrangement is connected thereto (see figs. 1, 4-5, and col. 3-line 20 to col. 5-line 37). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Tei et al. modified by Tomoyasu et al. so as to include the gas introducing part of Li et al. because this will allow for enhanced cleaning of the nozzles.

Response to Arguments

Applicant's arguments filed 11-5-02 have been fully considered but are not persuasive with respect to the Tomoyasu et al. reference. Applicant argues that the

Tomoyasu et al. reference, U.S. Patent 5,900,103 shows removing unnecessary gas components using a burner but fails to disclose removing the gas components through use of a vacuum pump and any statement of obvious with respect to using a vacuum pump is impermissible hindsight. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). For example, while the examiner agrees that a burner is used in the Tomoyasu et al. reference, the examiner disagrees that the use of a vacuum pump to remove the gas, for example, through outlet 750A in Figure 37 would have been unobvious. Clearly, the use of a vacuum pump to remove the gas through outlet 750A would have been well within the understanding of one of ordinary skill in the art. For example, in the embodiment of Figure 1, exhaust pump 45 is used to exhaust gas through outlet 41 (see col. 5-lines 10-19). For the reasons above, the rejection of the independent claims under 35 USC 103 using Tomoyasu et al., U.S. Patent 5,900,103, is respectfully maintained.

Regarding applicant's arguments with respect to the Fairbairn et al. references, these arguments are persuasive and therefore these rejections have been withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Luz L. Alejandro
Patent Examiner
Art Unit 1763

January 7, 2003